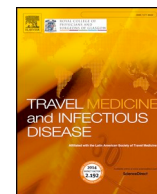




Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.



## Positive result of Sars-Cov-2 in sputum from a cured patient with COVID-19

To the Editor

Since December 2019, an outbreak of the novel coronavirus (SARS-CoV-2) infection has spread rapidly in Wuhan, China [1]. Over a month since the outbreak, more than 13,000 patients with COVID-19 have been cured and discharged from hospital until now. For the clinical cure criteria in China, twice successive negative results of Sars-Cov-2 nucleic acid detection are the important index, in addition to normal body temperature for 3 days as well as obvious improvement in respiratory symptoms and CT scan [2]. In the present work, we reported that Sars-Cov-2 nucleic acid was still detectable in sputum obtained by nebulization from a cured patient.

On January 22, a 49-year-old man presented himself with fever for 4 days to a clinic. Throat swab detection was positive for SARS-CoV-2 nucleic acid by real-time RT-PCR. Subsequently, the patient was diagnosed with COVID-19 according to the diagnostic criteria [2] as follows (1): the positive result of SARS-CoV-2 nucleic acid detection (2); a history of short stay in Wuhan within 14 days; and (3) symptoms of fever, and multiple patchy areas of ground-glass opacity on CT scan.

After the active treatment, the patient recovered from fever and other respiratory symptoms on February 4. On February 9 and February 10, the SARS-CoV-2 nucleic acid detection was successively negative in his throat swab samples. The CT scan result showed that the inflammation was significantly decreased in both lungs. Both the results of SARS-CoV-2 nucleic acid detection and CT scans indicated a recovery trend, and the patient was ready for discharge. On February 13, the throat swab and sputum by nebulization were collected before the patient was discharged. Notably, SARS-CoV-2 nucleic acid was still detected in sputum from the patient although negative result of throat swab detection.

WHO suggests that both specimens from upper and lower respiratory tracts should be tested to confirm the elimination of SARS-

CoV-2 [3]. We also found that SARS-CoV-2 nucleic acid might still be detectable in the lower respiratory tract specimens although negative results of throat swab detection. We hold the opinion that both specimens from upper and lower respiratory tracts must be collected for SARS-CoV-2 nucleic acid detection before COVID-19 patient could be discharged from hospital.

### Funding

This work was supported by grants from Key Research and Development Program of Weihai (Weihai Key Laboratory of Medical Microbiology and Immunology, 2017GGH08).

### Declaration of competing interest

None of the authors has any conflict of interest to declare.

### References

- [1] Zhu N, Zhang D, Wang W, et al. A novel coronavirus from patients with pneumonia in China. *N Engl J Med* 2019. <https://doi.org/10.1056/NEJMoa2001017>.
- [2] New coronavirus pneumonia prevention and control program (5nd ed.). National Health Commission of the People's Republic of China; 5 February 2020. (in Chinese) <http://www.nhc.gov.cn/yzygj/s7653p/202002/3b09b894ac9b4204a79db5b8912d4440.shtml>.
- [3] Clinical management of severe acute respiratory infection when Novel coronavirus (nCoV) infection is suspected: interim Guidance. World Health Organization; 2020 <https://apps.who.int/iris/handle/10665/178529>.

Ye-Min Qu, En-Ming Kang, Hai-Yan Cong\*

Department of Central Lab, Weihai Municipal Hospital, Shandong University, Weihai, China

E-mail address: [haiyanstu@163.com](mailto:haiyanstu@163.com) (H.-Y. Cong).

\* Corresponding author.